

DRAFT
ENGINEERING EVALUATION FOR DIESEL ENGINE
SAN MATEO COUNTY YOUTH SERVICES CENTER; PLANT 16930
APPLICATION 13417

BACKGROUND

San Mateo County Youth Services Center has applied for a permit for source 5, an emergency diesel engine powered generator and sixteen (16) natural-gas-fired Capstone 60 turbines. This evaluation is for the diesel engine only. The Capstone Gas Turbines are evaluated separately. The new engine is subject to the standard New Source Review requirements (including but not limited to BACT, cumulative increase, offsets, and public notification requirements if within 1000 feet of a K-12 school), plus the new NSR for toxic air contaminants plus the relatively new CARB Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM).

In accordance with the ATCM, District Regulation 9-8 and NSR for Toxic Air Contaminants, the operation of source 5 engine will be limited to the lesser of requested operation, no more than 50 hr/yr for reliability-related operation (maintenance and testing) and a reliability-related operating allowance which results in an incremental cancer risk for the "project" of no more than 10 in a million since the engine PM₁₀ emission rate is less than 0.15 grams per brake-horsepower hour. The operation of source 5 to provide power during emergencies will not be limited.

EMISSIONS

Emissions are calculated using an Excel spreadsheet. Calculations are discussed below and followed by a summary of emissions.

Source 5 is identified as a Caterpillar Model 3512B Diesel Engine with 1807.3 horsepower output rating. Run time and load are assumed to be 38 hours of allowable operation per year for reliability-related operation at 100% load. The emissions of sulfur dioxide were calculated assuming diesel fuel contains 0.05% sulfur by weight. The other pollutants were listed in the CARB Executive Order U-R-001-0266 as follows:

<u>Pollutant</u>	<u>Emission Factor, g/kW-hr</u>	<u>g/bhp-hr</u>
POC	0.4	0.3
NOx	8.8	6.6
CO	1.4	1.0
Diesel PM	0.18	0.13

<u>Pollutant</u>	<u>Emissions for Source 5 in tons per year</u>
NOX	0.067
CO	0.027
SO2	0.003
PM10	0.002
HC	0.004

TOXIC RISK SCREENING ANALYSIS

As discussed on page 1 (Background), source 5 is subject to the NSR for Toxic Air Contaminants. An analysis was performed for this new source only, since the potential emissions from the gas turbines permitted as sources 1 through 4 did not trigger an HRSA. Based on the HRSA, the proposed number of hours of operation was reduced from 50 hours per year to 38 hours per year. For 38 hours of reliability-related operation for this new source, the incremental cancer risk is 9.84 in a million and the chronic non-cancer hazard index is 7E-3. Both satisfy the allowable risk in Section 2-5-302.

STATEMENT OF COMPLIANCE

An emergency standby engine is not subject to NOx and CO standards in Regulation 9, Rule 8 but is subject to Sections 330 and 530 limiting reliability-related activities and requiring a non-resettable totalizing meter and a monthly log of usage. The non-resettable totalizing meter and monthly log of usage are included in permit conditions. Source 5 is subject to the SO2 limitations of Regulations 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Compliance with both of these requirements is assured since San Mateo County Youth Services Center uses CARB diesel fuel with a not-to-exceed 0.05% by weight sulfur limit. Like all sources, source 5 is subject to Regulation 6 ("Particulate and Visible Emissions"). This engine is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6 pending a regular inspection.

Source 5 will comply with the ATCM requirements. The ATCM (Section 93115 (e)(1) and (2)(A)3) requires:

- Emissions of diesel PM to be less than 0.15 g/bhp-hr
- Reliability related operation to not exceed 50 hrs/year
- Meeting off-road engine standards (Tier 1 minimum)
- Use of CARB diesel fuel or other approved fuel by 1/1/06

The engine is Tier 1 certified, the diesel PM emission rate is CARB certified at 0.18 g/kW-hr (0.13 g/bhp-hr), the applicant has accepted an annual reliability-related operation limit of 38 hours per year, and San Mateo County

Youth Services Center uses CARB diesel for its stationary engines.

Since Source 5 is co-located on the same parcel with a school and is within 500 feet of the school buildings, it potentially is subject to the ATCM provisions prohibiting stationary diesel emergency standby engine maintenance and testing at or near schools in the presence of students. At least some of the students will reside on-site and the engine supports the school. However, schools where students live on-site have been exempted from the provisions prohibiting stationary diesel emergency standby engine maintenance and testing at or near schools in the presence of students. (Reference: CARB Airborne Toxic Control Measure for Stationary Compression Ignition Engines, Section Section 93115 (c)(20))

The project is considered to be ministerial under the District's CEQA Regulation 2-1-311 because it is evaluated in accordance with Chapter 2.3 of the Permit Handbook and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors and therefore is not discretionary as defined by CEQA.

The project is co-located with a school and is therefore subject to the public notification requirements of Regulation 2-1-412. Part of the San Mateo Youth Service Center includes a school building within 1,000 feet of this source. A public notice for schools was distributed for this project. Comments were received and are addressed below:

To be determined

Source 5 will comply with the District NSR rule for Toxic Air Contaminants.

PSD, NSPS and NESHAPS are not applicable to these sources.

BACT and Offsets

Total facility emissions, including this project, will be less than 10 tons per year each of POC and NOx. Therefore, offsets are not required per Offset Requirements (2-2-302).

Source 5 is subject to BACT for NOx, CO, Sox, Diesel PM and POC. The engine emissions and the current BACT2 are:

Pollutant	Emission Factor	BACT2 Emission Factor
NOX:	8.8 g/kW-hr (6.6 g/bhp-hr)	6.9 g/bhp-hr
CO:	1.4 g/kW-hr (1.0 g/bhp-hr)	2.75 g/bhp-hr
PM10:	0.18 g/kW-hr (0.13 g/bhp-hr)	0.15 g/bhp-hr
POC:	0.4 g/kW-hr (0.3 g/bhp-hr)	1.5 g/bhp-hr
SO2:	CARB Diesel	<0.05% sulfur by wt

NOx, CO, PM10 and POC as listed above all satisfy BACT2. The use of CARB Diesel satisfies BACT2 for sulfur dioxide.

PERMIT CONDITIONS

Source 5 uses permit condition 22718, which is standard permit condition number 22068 revised to limit reliability related operation to 38 hours per year. This condition is attached.

RECOMMENDATION

Issue an Authority to Construct under Application Number 13417 to San Mateo County Youth Services Center for:

S5 Emergency Standby Diesel Engine, Caterpillar Model 3512B Diesel Engine, 1807.3 BHP

By:

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Air Quality Engineer II

1. The owner/operator shall operate each stationary emergency standby engine only for the following purposes:
 - a. to mitigate emergency conditions
 - b. for emission testing to demonstrate compliance with a District, state and/or Federal emission limit
 - c. for reliability-related activities (maintenance and other testing but excluding emission testing)(Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)3)
2. Operating for reliability-related activities is limited to 38 hours per stationary emergency standby engine per year.
(Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)3)
3. Operating while mitigating emergency conditions and while emission testing to show compliance with a District, state and/or Federal emission limit does not have an annual hourly limit.
(Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)3)
4. The owner/operator shall equip each emergency standby engine with a non-resettable totalizing meter that measures the hours of operation for the engine.
(Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations)
5. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least three (3) years from the date of entry for stationary emergency standby engine. Log entries shall be retained on-site, either at a central location or at the engine's locations, and made immediately available to the District staff upon request
 - a. Hours of operation for maintenance and other testing but excluding emission testing
 - b. Hours of operation for emission testing to show compliance with emission limits
 - c. Hours of operation to mitigate emergency conditions
 - d. For each emergency, the nature of the emergency condition
 - e. Fuel usage for engine if a non-resettable fuel usage meter is utilized
 - f. CARB Certification Executive Order for the engine(Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, Regulation 1-441)